

WEST VIRGINIA DEPARTMENT OF AGRICULTURE
PLANT PEST CONTROL DIVISION
COOPERATIVE FOREST PEST ACTION PROGRAM

1974 ANNUAL SUMMARY

This newsletter is a summary of the observations and field work completed during the ninth season of cooperative forest insect and disease detection surveys.

GENERAL COMMENTS

During the month of January we experienced very warm weather which caused the Virginia pine sawfly to hatch. The young larvae were subsequently killed by cold weather. The pest identification laboratory logged in and answered 511 insect and disease problems in 1974. Most of the specimens were submitted during the months of May, June, July and August. A total of 653 telephone calls requesting assistance or information were received at this office during 1974. Of this total, 544 calls were received from April 1, to September 30, 1974.

Early summer or late spring defoliators caused the most defoliation to the hardwoods in West Virginia. The late summer defoliators were more abundant this year than in previous years. The fall webworm and pin oak sawfly are on the increase.

FOREST INSECTS

Oak leaf tier - Croesia albicomana. In March of 1974 an egg survey was conducted in the Marlinton, Bartow and Neola Areas to predict the 1974 defoliation by this insect. It was predicted that 200,000 acres of oaks would have light to moderate defoliation. The egg survey showed an increase in eggs per 15" branch sample from 1973. Ground surveys during late spring showed about 10,000 acres heavily defoliated. An additional 100,000 acres had light to moderate defoliation (0-25% defoliation).

In the summer of 1973 and 1974 Jerry Leonard, a summer employee, took increment borings from ten red oak trees at seventeen different locations. The sites were divided into four categories:

1. Uninfested area - good site
2. Uninfested area - poor site
3. Infested area - good site
4. Infested area - poor site

These increment borings were brought to the lab and growth rings counted and the average growth was plotted. (See graph No. 1 at end of summary)

All seventeen sites were then put into one graph. The first year that defoliation was noted or reported was in 1965. The graph indicates we probably had some defoliation before this time, probably about 1961.

Heavy damage (76-100% defoliated) occurred in 1965 and 1966. A survey was conducted in late summer of 1966 to determine mortality. The results were as follows:

Percent of Total Stand Involved	Total Acres Affected	Condition	Acreage
1-5%	36,810 acres	1 tree/acre	32,000
5-10%	66,652 acres	2-3 tree/acre	128,000
11-25%	5,763 acres	50 trees/sq. mi.	100,000
50-100%	3,374 acres	50-100 trees/sq. mi.	640,000
	<u>117,452</u>		<u>900,000</u>

The graph indicates the greatest growth loss from about 1964 to 1970. It seems the stands are recovering and returning to normal growth. One must realize many of the host trees no longer exist and many sites have reverted to White Pine.

Along with the insect attacks we experienced late freezes in some areas.

PREDICTIONS FOR MAY-JUNE 1975

In December, 1974, Phil VanBuskirk conducted an egg survey for the oak leaf tier in the Moorefield, Elkins, Franklin, Green Bank, Marlinton and Alvon areas.

Results of this survey indicate we can expect moderate (25-75%) defoliation to occur on 100,000 acres in the Bartow to Seneca State Forest Area. Negligible to light defoliation will occur elsewhere. No insects were found in the Elkins, Franklin, Moorefield and Jordan Run Areas. See Map No. 1.

FOREST TENT CATERPILLAR - Malacosoma disstria. This insect has not been a problem since 1970 when defoliation was widespread in the Northern Panhandle. This year the area around Bartow seemed to have an abundance of caterpillars.

THE EASTERN TENT CATERPILLAR - Malocosoma americana. This insect continues to be at very low levels and will probably stay this way for a few years.

VIRGINIA PINE SAWFLY - Neodiprion pratti pratti. Thanks to the unusual weather conditions this insect hatched in January of 1974 and was frozen shortly thereafter. No defoliation was noted in southern West Virginia. However, some defoliation did take place in central and northwestern parts of the state. Unusual weather conditions in January 1975 have again foiled the insect. If weather keeps on at this rate we may eliminate the insect from southern West Virginia. This makes the 4th year in a row that the insect has hatched in January.

PERIODICAL CICADA - Magicalicada septendicum. Brood XIV appeared on schedule in Southwestern West Virginia. Numerous calls were received at the office (as many as 17 per day) when the cicadas were calling and making an unbearable noise. Flagging or dead tips, caused by the female ovipositing eggs, were noticed throughout the region. A small part of this brood occurred in Hampshire, Morgan and Berkeley counties. The next appearance of cicadas will be Brood I in 1978. This brood will cover the central part of the state.

PINE LEAF CHERMID - Pineus pinifoliae. This insect continues to cause damage to red spruce and white pine in West Virginia.

FALL WEBWORM - Hyphantria cunea. It seems all counties in the state experienced some degree of infestation by this insect. The heaviest infestations seemed to occur in Preston, Tucker, Greenbrier, Hampshire and Mineral counties. Populations of this insect are expected to increase and cause defoliation in 1975.

LOCUST LEAF MINER - Odontota (Xenochalepus) dorsalis. This insect caused extensive damage to black locust throughout the state. The only area apparently free from the insect was in the Allegheny Mountain region. The damage this year was comparable to that of last year, which was the heaviest since 1966 when insect surveys started in the state.

A LEAF MINING WEEVIL - Odontopus calceatus. This insect feeds upon yellow poplar and sassafras. The insect was abundant but little damage was observed to trees in the state.

FALL CANKERWORM - Alsophila pometaria. Surveys conducted in February-March, 1974, indicated heavy defoliation would occur to approximately 2000 acres of hardwoods in Grant County. An aerial survey conducted the last of June 1974, showed 3000 acres to be completely defoliated. This area extended from Dolly Sods in Grant County to Pinnacle Rock in Mineral County. See Map No. 1.

One of the studies conducted at the Sods area show hatching dates of the eggs are about 1-2 weeks apart. This is due to the difference in elevation which is about 1300 feet. The cankerworm hatches on the east slopes of the Allegheny front about June 10. The hatch on top of the mountain takes place about June 20.

Approximately 1200 acres in Jefferson County along the Blue Ridge Mountains were defoliated by the cankerworm in mid-May.

Numerous trips were made to the Sods area in late summer and fall to try and find the pupae of this insect. Pupa were finally found in early fall and sample plots were run. It was found that pupae sampling was time consuming with very few pupae collected. This method of predicting infestations was dropped. It was decided that trees banded with tanglefoot would possibly give us information needed to predict defoliation. The tanglefoot (a sticky material) was placed on trees about 3½ feet above the ground and about a 4 inch band around the tree. These trees were banded in early fall and then checked in late November and December. The results of this survey seemed to vary greatly from published material on predicting defoliation in other states. The data collected here will be correlated with egg sampling and defoliation this year to provide a method of predicting defoliation.

The results of the tanglefoot barriers are as follows: In the Dolly Sods area the average number of females was 1.2 per tree. The average number of males per tree was 36.2. At approximately 1300' below the sods area the average number of females per tree was 7.0 and the average number of males per tree was 26.0. The Mount Storm area had an average of 36.6 females per tree and 75.0 males per tree. From all data collected the females and males were most active or emergence occurred about November 20-25, 1974.

Egg sampling surveys have been completed in the Mount Storm area and it is expected that heavy defoliation will occur over 2000 acres in this area. Due to inclement weather the sods area has not been sampled for eggs and no prediction can

be made at this time. There will be a news release in early spring predicting the degree of defoliation that will take place.

The parasite Brachymeria intermedia was released in the Sods area. For additional information refer to Biological Control Program Activities.

A carabid beetle (Calosoma frigidum) was abundant in the Sods area. This beetle is a natural predator and may account for a decrease in populations of defoliators.

WALKINGSTICKS - Diapheromera femorata. In 1973 the outbreak of this insect occurred in various sections of the state. It was not known at that time if the insect would reappear in 1974 or 1975. Observations made in 1974 showed areas defoliated by walkingsticks but they were not the same areas as 1973. The infestations in 1974 were, however, in the same general area and county. It is not known if this was the same generation or another generation which would hatch in 1976. A follow up this year will, we hope, solve the problem as to when the insects hatch.

SOUTHERN PINE BEETLE - Dendroctonus frontalis. This insect continues to be a problem in the south. Ten states are experiencing a current beetle outbreak (see Map No. 2). A summary of mortality caused by the southern pine beetle in 1973 for the entire southeast shows there to be 380 million bd. ft. and 964,700 cords of timber lost. This amounts to a value of approximately 41 million dollars.

In West Virginia the beetle continues to cause death to pines in southern West Virginia. Wayne and Fayette counties have been added to the list of counties having this insect. Approximately 60 acres of Virginia pine was killed around East Lynn Lake in Wayne County.

At the present time the Southern pine beetle is known to be in Kanawha, Boone, Fayette and Wayne counties. A. D. Hopkins in 1890-1893 found this insect to be causing mortality to Red Spruce in Tucker, Randolph, Pendleton and Greenbrier counties. Hopkins also notes finding this insect on pine in Hampshire, Hardy, Monongalia and Wood counties. An account of this information can be found in Bulletin #32; 56 and 31 W. Va. Agriculture Experiment Station 1893.

GYPSY MOTH - Porthetria dispar. The Gypsy Moth continues to move south and west. In the northeast, gypsy moths defoliated 750,905 acres in seven states this past summer. In 1973, the insects damaged 1,777,406 acres in nine states. Maine and Massachusetts were the only two states to report increases this year, whereas no defoliation occurred in New Hampshire or Vermont.

The sharp decrease in acres defoliated is attributed to unusual combination of weather conditions, an insect virus, control by parasites, and extensive state, federal and private control programs. State and federal officials treated about 400,000 acres with control chemicals in the northeast and Michigan.

The number of parasitoids released/site was substantially increased over that of 1973. It was anticipated that this, in conjunction with improved site selection, would substantially increase likelihood of establishment. Based on the amount of evaluation work accomplished, however, it was totally impossible to appraise the effect of the increased numbers.

Significant evaluation efforts were limited to only two of the releases due to personnel limitations and Program priorities. Two-hundred twenty-four Croesia

semipurpurana pupae were collected during the first week and 241 in the second week after release of 10,000 Brachymeria intermedia in an area near Durbin, Pocahontas County. No. B. intermedia were recovered from these pupae. However, two B. ovata (a native Brachymeria species) specimens were recovered along with numerous other, as yet unidentified, native parasitoids.

An additional 50 C. semipurpurana pupae were collected and subjected to ovipositing by our laboratory colony of B. intermedia and 12 adult parasitoids were recovered (10 males, 2 females). The oak leaf tier pupae were, of course, quite small and the adult parasitoids were correspondingly reduced to a size (3.5 mm) that must be near the lower limit of the species. This reduction in size was also observed in the B. ovata specimens mentioned above, as larger (5 mm) specimens of B. ovata had been previously (June 1973) collected from Malacosoma americanum. Burks (1960) lists the size range of B. ovata as 3.5-6.5 mm.

Negative results were obtained in the Meteorus pulchricornis evaluation also. Two-hundred twelve Alsophila pometaria larvae were collected six days after release of 205 adult parasitoids and only native species of parasitoids were recovered.

However desirable, establishment evaluation in the year of release is not an absolute prerequisite for parasite releases, since true establishment requires overwintering. Therefore, our intentions include subsequent evaluation of at least the more promising of previous release sites.

Three strains of B. intermedia are currently being maintained in our laboratories. These strains are the result of foreign shipments received from the Beneficial Insect Research Laboratory, Newark, Delaware, in July, 1974. Strain 1 is from Mamora Province, Morocco, Strain 2 the Island of Corsica, and Strain 3 is a cross of 1 and 2 with our lab colony as it existed prior to the introduction of 1 and 2.

As part of our continuing effort to begin surveying systematically for parasites and predators of defoliating Lepidoptera, 12 McPhail traps were secured through Mr. Stanley Moore (USDA, APHIS). This trap has been tested by the USFS and has shown promise as an effective survey tool for some of the parasitic tachinids (Diptera). Six of these traps were then loaned to Dr. Robert Schroeder (USDA, ARS, Beneficial Insect Introduction Laboratory) who is cooperating in our Eastern Panhandle survey work. Five of these six were destroyed by vandals while in use, but in spite of this a series of collections were realized from this effort. Results are not available at this time however. A series of collections from two traps, operated in Pocahontas County between mid-July and mid-September by Phil VanBuskirk, is stored in vials for later examination.

Seven male moths were caught in West Virginia this year (See Map No. 3). This makes a total of 24 male moths caught in 23 traps the past 3 years. Male moths were caught in Morgan and Fayette counties for the first time.

Burlap bands were placed on host trees at each positive site in 1974. These bands were checked throughout the summer and fall for larvae, and pupae. The results were negative. Additional bands will be placed in 1975 on host trees in old and new positive catch sites. These bands will be checked throughout 1975. Egg mass surveys have not been conducted at present time but will be done in early spring.

The trapping program this year entailed a 3 mile grid system in the eastern panhandle and random sites elsewhere in the state.

All state parks, forests, public hunting and fishing areas and Corp of Engineers land was trapped. Service Foresters maintained 25 traps in the following counties: Pleasants, Ritchie, Lewis, Gilmer, Calhoun, Wirt, Wood, Jackson, Roane, Lincoln, Putnam, Mason, Cabell and Wayne. Fifty (50) traps were placed in Kanawha County.

Approximately 4000 traps were placed and maintained in West Virginia in 1974.

SUMMARY OF 1974
GYPSY MOTH
BIOLOGICAL CONTROL PROGRAM ACTIVITIES
IN WEST VIRGINIA.

Three species of polyphagous gypsy moth parasitoids were released in West Virginia during 1974. They were the pupal parasitoids Brachymeria intermedia and Coccygomimus sp. and the early instar larval parasitoid Metecorus pulchricornis. The first two are being reared in our laboratories and the latter was received from the New Jersey Department of Agriculture. Pertinent release information on each species is presented in tabular form at the end of this report.

Considerably more attention was given to release site selection than in 1973. This involved primarily the location and identification of potentially suitable alternate host populations for releases, as opposed to releasing in areas of male gypsy moth trap catches with little or no knowledge of alternate hosts in these areas. Potentially suitable alternate hosts were selected on the basis of laboratory testing and/or literature review and analysis.

Inflation has been rampant in nearly all segments of the economy and insect artificial diet components are no exception. As a result, we have been experimenting with our wax moth larval diet in an attempt to cut costs and initial results are encouraging. Evaluation of the various diets being tested is still in progress and judgment is being withheld pending the outcome of more extensive testing.

LITERATURE CITED

- Burks, B. D. 1960. A Revision of the Genus *Brachymeria* Westwood in America North of Mexico (Hymenoptera: Chalcididae). From the Trans. Amer. Entomol. Soc. Vol. 86, pp. 225-73.

1974 Brachymeria intermedia Releases
in West Virginia

County	Nearest P. O. or City	Date	Host (s)	Number Released
Pocahontas	Durbin	6-4-74	<u>Croesia semipurpurana</u>	10,000
Grant	Streby	6-14-74	Complex of summer defoliators	2,750
Hampshire	Capon Bridge	7-1-74	<u>Dasychira basiflava</u>	2,000
Greenbrier	Williamsburg	8-20-74	<u>Hyphantria cunea</u>	11,000
Hampshire	Capon Bridge	8-27-74	<u>Polia latex</u>	8,000
Tucker	St. George	8-28-74	<u>H. cunea</u>	6,000
Greenbrier	Frankford	9-24-74	<u>H. cunea</u>	3,600
Randolph	Beverly	10-6-74	Used as demonstration at Forest Festival	400
Boone	Turtle Creek	10-14-74	Demonstration for farmers	300
Total				44,050

1974 Coccygomimus sp. Releases
in West Virginia

County	Nearest P. O. or City	Date	Host (s)	Number Released
Hampshire	Capon Bridge	7-1-74	<u>Dasychira basiflava</u>	400
Greenbrier	Williamsburg	8-20-74	<u>Hyphantria cunea</u>	1,000
Boone	Turtle Creek	10-24-74	Clean colony of holdovers and demonstration	800
Total				2,200

1974 Meteorus pulchricornis Release
in West Virginia

County	Nearest P. O. or City	Date	Host (s)	Number Released
Grant	Streby	6-13-74	<u>Alsophila pometaria</u>	205

Total of all gypsy moth parasites released 1974: 46,455

1974 Brachymeria intermedia Releases
in West Virginia - County Totals

Boone - - - -	300	Pocahontas -	10,000
Grant - - - -	2,750	Randolph - -	400
Greenbrier -	14,600	Tucker - - -	6,000
Hampshire -	10,000		
Total			44,050

1973-74 Brachymeria intermedia Releases
in West Virginia - County Totals

Berkeley - - - - -	7,000	Jefferson - - - - -	4,000
Boone - - - - -	300	Kanawha - - - - -	250
Grant - - - - -	5,750	Pendleton - - - - -	1,000
Greenbrier - - - - -	14,600	Pocahontas - - - - -	15,831
Hampshire - - - - -	11,000	Randolph - - - - -	400
Hardy - - - - -	1,000	Tucker - - - - -	6,000
Total			67,131

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AN ERIOPHYID MITE - Nalepella tsugifoliae. This mite caused heavy damage to hemlocks in Clay County nurseries. Light damage was recorded on hemlock in nurseries located in Wood and Greenbrier counties. This is the first report or finding of this insect as a nursery pest in West Virginia.

BAGWORM - Thyridopteryx ephemeraformis. The bagworm seemed to be state-wide and caused defoliation to many trees and shrubs. The most commonly attacked plant species were Junipers and Arborvitae. Numerous phone calls were received at the office concerning this insect.

BLACK VINE WEEVIL - Brachyrhinus sulcatus. This weevil, as a larva feeds on the roots of many plants and causes damage to nursery stock. Adult feeding scars on the leaves can be found on Yews throughout the state. Occasional specimens were found on Rhododendron.

SPITTLE BUGS - PINE and SARATOGA - Aphrophora parallela and Aphrophora saratogensis. Attack by these insects seemed to be at a low level this year. These insects were common locally but nowhere were they causing noticeable damage.

EASTERN SPRUCE GALL APHID - Adelges abietes. Very few galls were observed this year on Norway Spruce in Christmas tree plantations in West Virginia. It appears the insect is on the decrease or perhaps at the lowest level seen in past years.

THE PINE OAK SAWFLY - Calioea lineata. This sawfly caused near complete defoliation to 1500 acres of Red Oak in Summers County during the latter part of July and mid-August. The insect also caused heavy damage to 50 acres of oak in Greenbrier and 15 acres of oak in Monroe counties. This insect seems to be on the increase and we may expect defoliation to cover many areas in 1975. The State of Kentucky reports the sawfly caused scattered to continuous defoliation over 335,000 acres in Kentucky.

The following is a list of insects that were sent or reported to the Pest Identification Laboratory. Many were not found in sufficient numbers to damage host plants.

Sawflies:

A Sawfly Neodiprion sp. causing light to moderate damage to pitch pine throughout Pendleton County. (Harry Wilson)

A Sawfly Trichiosoma triangulum causing damage to Black Cherry in Randolph and Pocahontas counties. (P. VanBuskirk)

An unidentified sawfly causing moderate damage to Black and fire Cherry in Ritchie County. (J. Szeliga)

Red-headed Pine Sawfly - Neodiprion lecontei. Light damage recorded on Virginia pine in Mineral County. (D. Eskridge) Light feeding observed on one acre of Scotch Pine in Mineral County. (D. Eskridge) 90% of 3 year old Scotch pines in a one acre plantation was completely defoliated. (R. Whipkey)

The pin Oak Sawfly - Caliroa lineata. Found causing damage to red oak in Calhoun County. (J. Atkins) 50-100 acres of red Oak defoliated in Summers County. (R. Arnold) 40-50 acres of red Oak defoliated in Monroe County. (E. Bostic)

The elm sawfly - Cimbex americana. Found on Willow in Taylor County. (L. Bartlett)

EUONYMUS SCALE - Unaspis euonymi. Found causing heavy damage to euonymus in Kanawha County. Many specimens were received in the laboratory. Found on euonymus in Jackson County (L. L. Smith). The San Jose scale abundant on *Pyra-cantha* in Kanawha County.

THE YELLOW POPLAR SCALE - Toumeyella liriodendri. Found on yellow poplar in Jackson County. The tree was experiencing some die back. Reported from Kanawha County on Yellow Poplar.

THE SCURVY SCALE - Chionaspis furfura. This was submitted to the laboratory. Host species include apple, flowering cherry, and flowering plum. This marks the first year we have received numerous specimens of this scale.

THE PINE TORTOISE SCALE - Toumeyella numismaticum. Found to be causing light damage to one acre of Virginia pine in Grant County. (J. Anderson)

Gall insects accounted for about 1/5 of the telephone calls made to the laboratory. Numerous galls were reported from hickory, maple, oaks and other hardwoods. Listed are just a part of the many specimens received.

THE MAPLE BLADDER GALL - Vasates quadripedes. Submitted from Kanawha County and found on Red and Sugar Maple. Numerous specimens sent in. On Sugar Maple in Cabell County.

THE LARGE OAK APPLE - Amphibolips confluens. Found on Black Oak in Brooke County. (E. Murriner)

A GALL INSECT - Eriophyes negundi. Found on Box elder in Cabell County.

THE HICKORY GALL APHID - Phylloxera caryaecaulis. Seems to be common throughout the state. Numerous specimens submitted.

HACKBERRY NIPPLE GALL causing moderate damage to hackberry in Ohio County.
(E. Murriner)

APHIDS - Numerous specimens of aphids were submitted from a variety of hosts. Aphids will cause the tree or plant to appear sickly or unhealthy but death is seldom associated with aphid attack.

ASIATIC OAK WEEVIL - Crytepistomus castaneus. Very few weevils were reported or submitted to the laboratory this year. One new county record was established this being Greenbrier County. (G. Gibson)

THE SPRING WITCH HAZEL GALL APHID - Hamamelistes spinosus. Found to be causing moderate-heavy damage to 10 acres of birch in Mineral County. (L. Miller)
Found on Birch in Marion County. (D. Morrison)

A PINE NEEDLE MIDGE - Janetiella coloradensis. Found on Virginia pine in Calhoun County.

THE GRAIN STRIPED MAPLE WORM - Anisota rubicunda. Found causing noticeable damage to Maple on Middle Mountain in Randolph County. (P. VanBuskirk) Found on Maple in Grant County. (J. Anderson) Light defoliation recorded on Hickory in Mineral County. (T. Cooper)

THE ORANGE STRIPED OAKWORM - Anisota senatoria. Found causing light damage to Pin Oak in Cabell County. (D. Lilly) Reported as causing light damage to white and scrub oak throughout Mineral County. (D. Eskridge)

THE SPINY OAK WORM - Anisota stigma. Found causing light to moderate damage to Black Oak in Ritchie County. (J. Szeliga) Two scrub oak were completely defoliated by the oak worm in Mineral County. (A. Miller)

THE DATANA CATERPILLARS have a habit of raising their head and tail ends when disturbed and several species were common this year but caused little damage to host trees. Datana major found on Huckleberry in Lewis County, (R. Fowler); found on Azalea plants in Cabell County. The Yellow Necked Caterpillar Datana ministra found on red oak in Mineral County. (D. Eskridge)

Most TUSSOCK MOTH specimens received in the laboratory were collected from under burlap bands at Gypsy Moth male moth sites. Dasychira basiflava collected from Red Oak, Chestnut Oak and White Oak in Pendleton and Hampshire counties. Dasychira obliquata collected from White Oak in Hardy County.

THE SYCAMORE TUSSOCK MOTH Halisidota harrisii, caused light to moderate defoliation to $\frac{1}{4}$ acre of sycamores in Ritchie County. (J. Szeliga)

THE HICKORY TUSSOCK MOTH Halisidota caryae found on red oak in Ritchie County. (J. Szeliga) Light defoliation on 15 acres of Hickory in Harrison County. (D. Hill)

The incidence of tussock moths seemed to be common this year but no large areas of defoliation were noted.

THE WHITE PINE WEEVIL, Pissodes strobi, seemed to be very common in the eastern panhandle causing heavy damage to terminals of white pine. Specimens were also submitted from Mercer County where they were found attacking White Pine. (R. McBride)

THE NANTUCKET PINE TIP MOTH, Rhyacionia frustrana, found causing heavy damage to Scotch pine in a Christmas tree plantation in Wood County. Occasional Virginia pine trees heavily damaged in Berkeley County.

THE PITCH MASS BORER, Vespamira pini, was found attacking Red Pine at the V. A. Hospital in Clarksburg. Numerous pitch globes were observed on the Red Pine trees surrounding the hospital.

THE PITCH TWIG MOTH, Petrova comstockiana, seemed to be common throughout the state and found on most species of pine.

A ROUND HEADED BORER, Obera bimaculata, was found causing moderate damage to domestic cherry in Grant County. (J. Anderson)

Specimens of the DOGWOOD TWIG BORER, Oberea tripunctata, were submitted from Pendleton (H. Wilson) and Fayette counties.

Numerous CUTWORMS were found on various trees in the state. The most significant cutworm found was Polia latex, which was very common under burlap bands placed at Gypsy Moth sites. Specimens were collected from Jefferson, Berkeley, Hampshire and Pendleton counties.

Beneficial insects were very common this year. Specimens were submitted from throughout the state. The most striking example of what beneficial insects can accomplish was noted in Mineral County where the Wheel bug Arilus cristatus killed all adult Japanese beetles on wild grape that was used as a fence or hedge.

Numerous specimens of the pigeon tremex were submitted. This insect uses its long oripositor to pierce the bark of trees and lay eggs on harmful insects already inside the tree.

Numerous slug caterpillars were submitted this year. Some were not identified, however the most common slug caterpillar sent in was Euclea delphinii. Slug caterpillars can and will cause considerable damage to host plants but no such areas were noted this year.

THE LARGER ELM LEAF BEETLE, Monocesta coryli, was very common throughout the state. The beetle was reported causing heavy damage to Elm, currant and gooseberry throughout Monroe County. 95% defoliation to small sawtimber trees occurring generally throughout Braxton County. (R. Whipkey) Found causing heavy damage to elms throughout Mineral County. (D. Eskridge)

50-75% defoliation on Elm trees was observed in Big Otter and Nebo sections of Clay County.

THE POPLAR TENT MAKER, Ichthyura inclusa, found on Basswood in Pendleton County. (E. Emerson)

THE CECROPIA MOTH, Platysamia cecropia, found feeding on Black Alder at Parsons State Tree Nursery. (R. Smith)

LACE BUGS were common this year throughout the state and were found mainly on Sycamore and White Oak. Reported as causing considerable damage to sycamore throughout Mineral County. (D. Eskridge)

THE COOLEY SPRUCE GALL APHIS, Adelges cooleyi, was reported from Wetzel County where it was found on Douglas Fir and Blue Spruce.

THE SADDLE BACK CATERPILLAR, Sibine stimulae, was submitted from Kanawha County where it was found feeding on box-elder. Reported from Pendleton County where it was feeding on Willos. (J. Anderson)

THE CATALPA SPHINX, Ceratonia catalpae, seemed to be common this year wherever catalpa was growing. A new county and host record was established this year from Ritchie County where the sphinx was found feeding on Walnut.

THE CLEFT-HEADED SPAN-WORM, Biston cognataria, was found causing light damage to Wild Black Cherry on Middle Mountain in Randolph County. (P. VanBuskirk)

Nests of the UGLY NEST CATERPILLAR, Archips cerasivorana, were common throughout the state, but nowhere caused any noticeable damage. The insect was reported from Tucker County where it was causing heavy damage to Wild Black Cherry and Hawthorn.

THE MAPLE TRUMPET SKELETONIZER, Epinotia aceriella, was found causing defoliation to several Sugar Maple on (ornamental yard trees) in Greenbrier County. (T. Casto)

THE BUCKEYE WEBWORM, Archips rileyana, and a WEBWORM, Tetralopha asperatella, were found on buckeye and white oak respectively in Greenbrier County. (T. Casto)

AN OAK LEAF TIER, Psilocorsis obsoletella, caused light damage to oaks throughout Clay and Raleigh Counties. (J. Faulk)

PERSONNEL CHANGES

Larry Freeman of the USFS, who was in charge of the Delaware Field Office at Delaware, Ohio, has accepted a position change and is now located on the West Coast. Dan Brown is now the head of the Delaware field office.

Jim Hanson, Entomologist at the Delaware office has moved to the USFS office in Milwaukee, Wisconsin. Dave Holland is now Entomologist at the Delaware office.

Jerry Atkins, Service Forester at Spencer, W. Va., has accepted the position of Assistant District Forester in the Romney District.

Philip Wygal has been promoted to the position of District Forester at Romney. Philip has served in the capacity of Assistant District Forester at Romney for the past four years. This promotion fills the vacancy created by the death of John Porter in October.

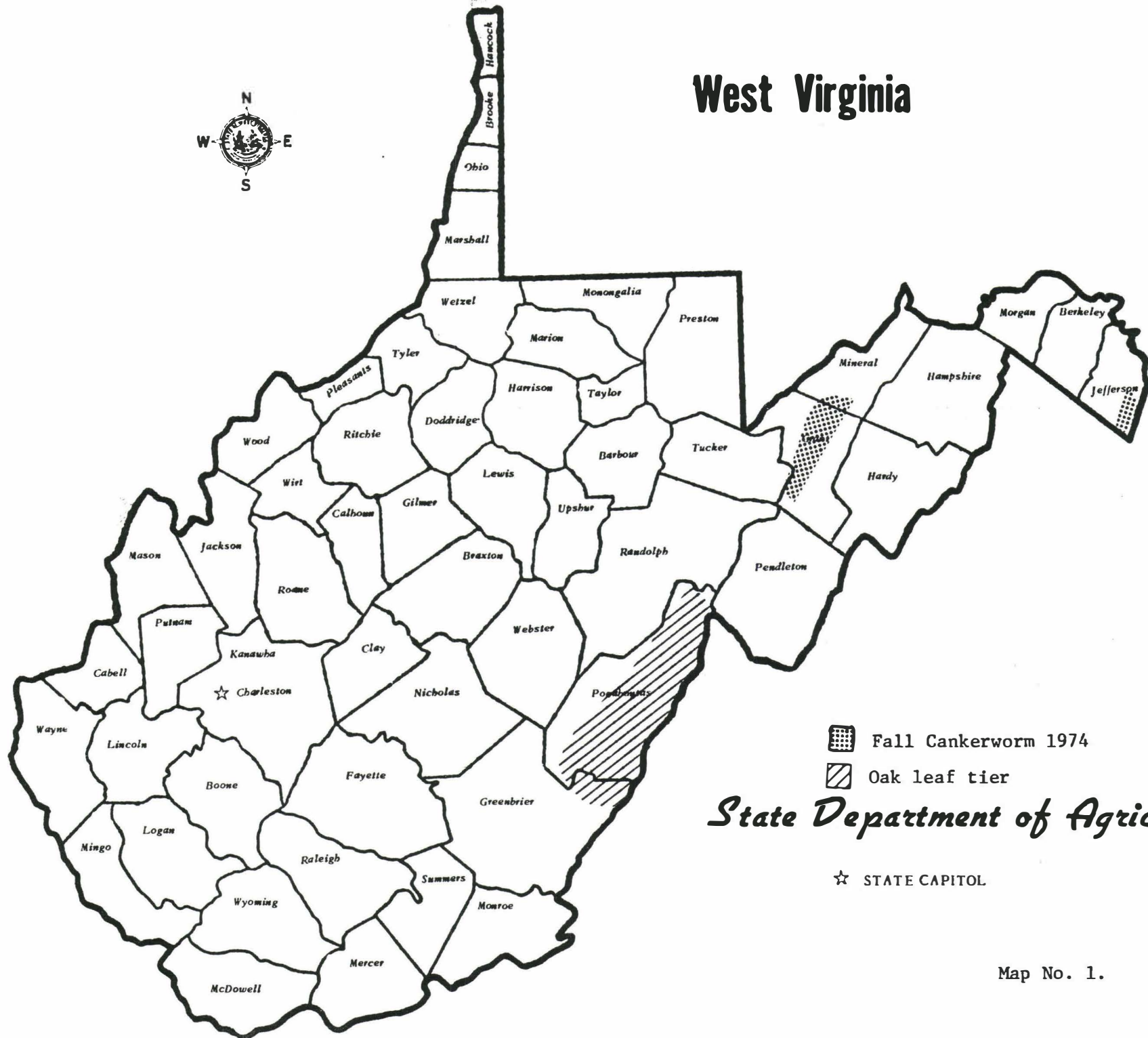
Terry Fleming has accepted employment with the Department of Natural Resources as Watershed Specialist. He is stationed at Morgantown.

Scott Brand has accepted the new position of Timber Harvesting Advisor with the Department of Natural Resources. He is stationed at Kingwood.

Mayford Lake, formerly with J. P. Hamer Lumber Company, has accepted the position of Service Forester for Webster County.

Dave Lilly, Service Forester at Huntington, has been promoted Staff Assistant to Asher Kelly in the Charleston office.

West Virginia



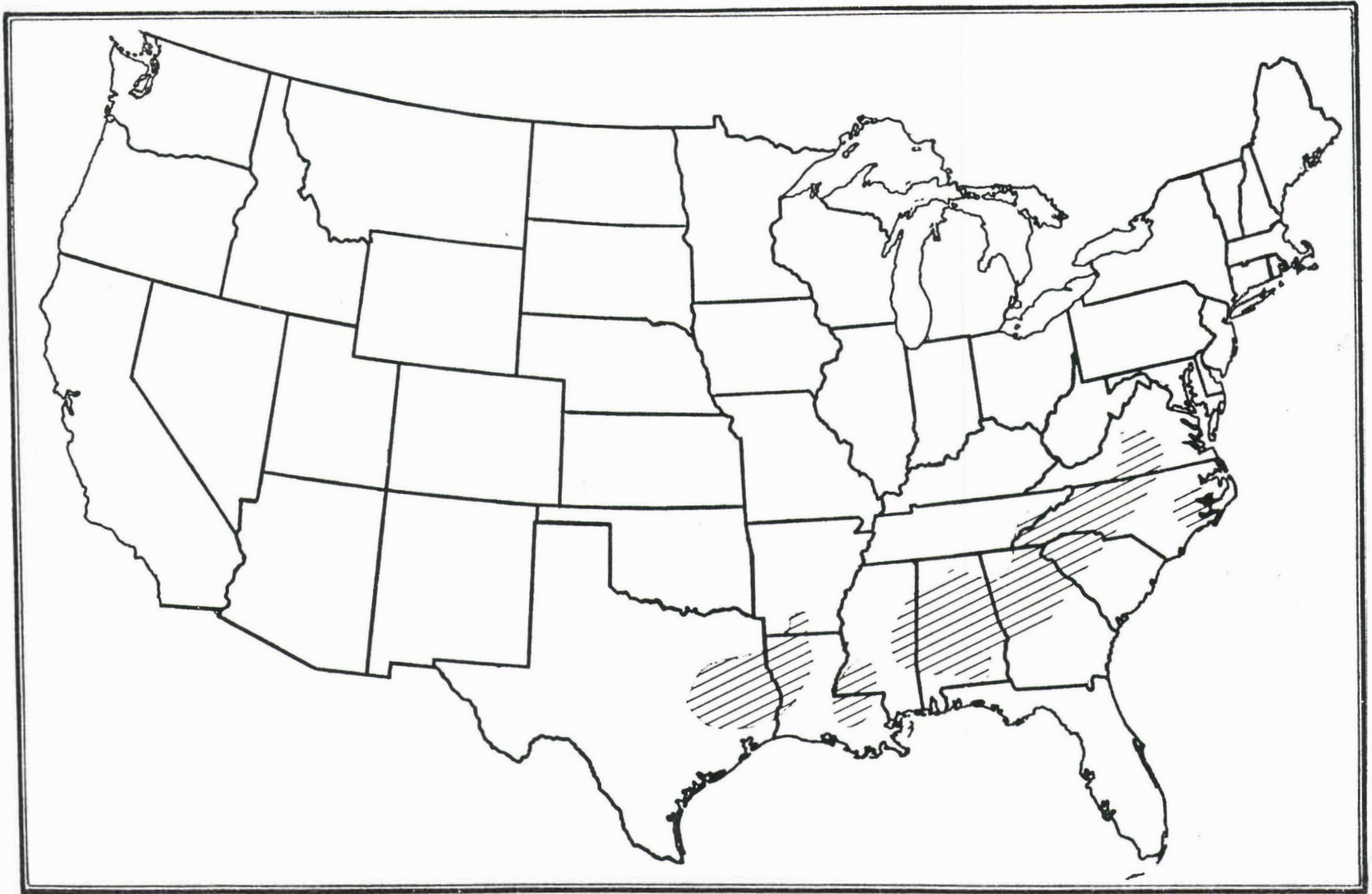
 Fall Cankerworm 1974

 Oak leaf tier

State Department of Agriculture

☆ STATE CAPITOL

Map No. 1.



SOUTHERN PINE BEETLE

Map No. 2.

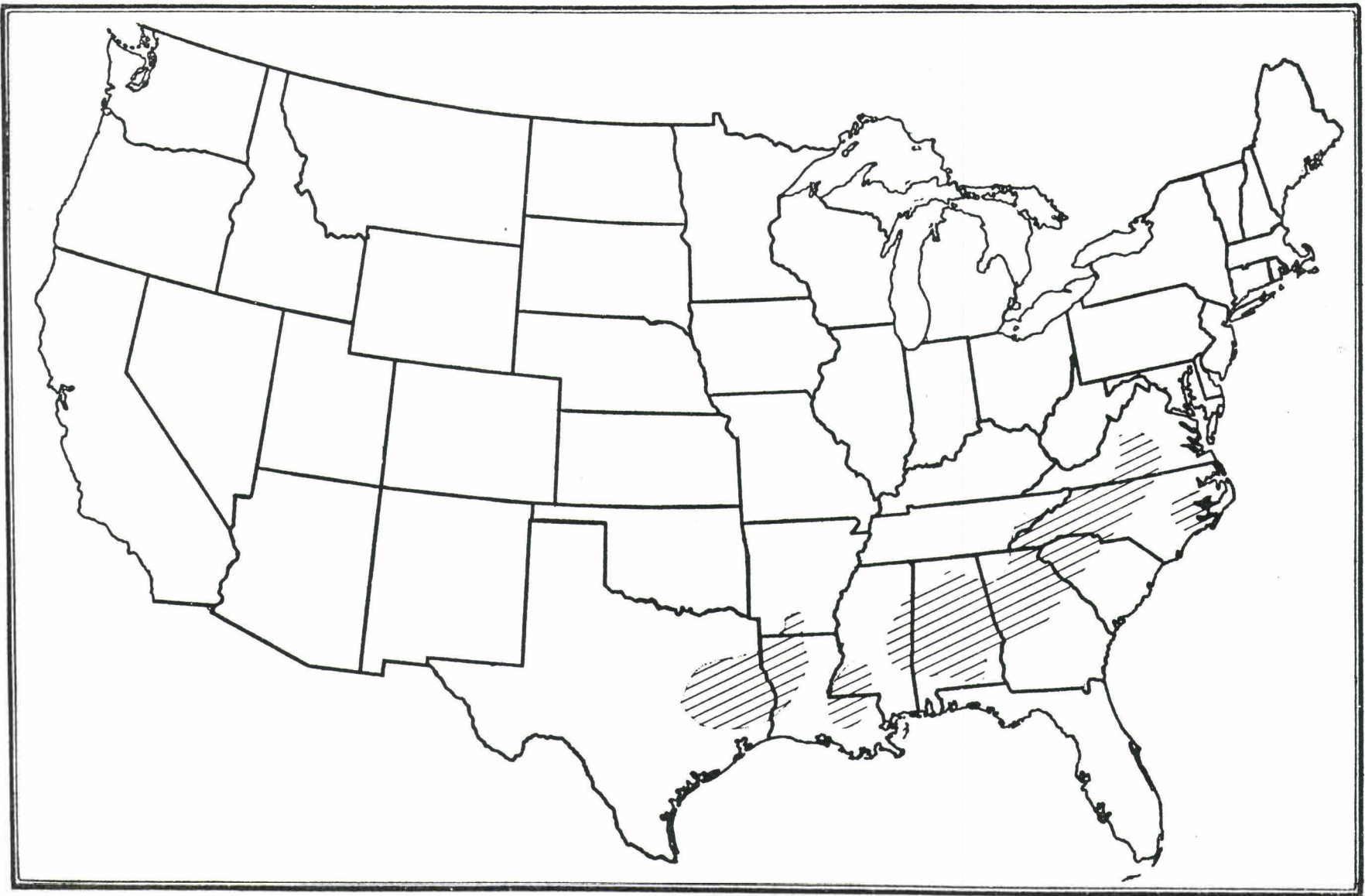
**Report observations and specimens
of insects and diseases to:**

**Plant Pest Control Division
West Virginia Department of Agriculture
State Capitol Building
Charleston, W. Va. 25305**

COLLECTING VIALS WILL BE SENT UPON REQUEST.

This Annual Summary is prepared by:

Alan R. Miller, Forest Entomologist and
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SOUTHERN PINE BEETLE

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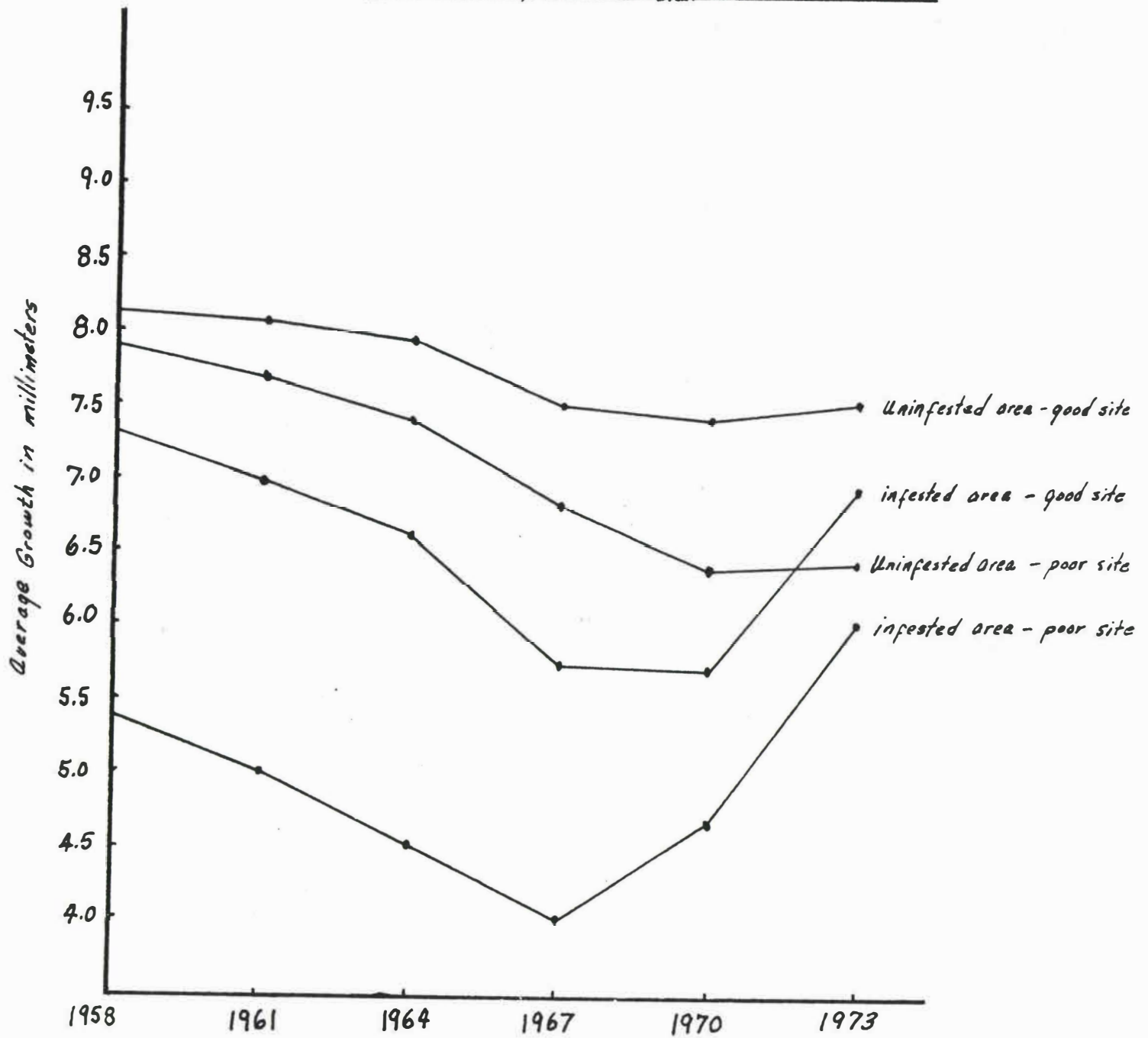
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Affects of Defoliation on Hardwoods in
Pocahontas, Greenbrier and Pendleton counties



Graph No 1

NEW STATE RECORDS - 1974

The following insects are New State Records for 1974. These findings are the results of the Cooperative Insect Program.

<u>NAME</u>	<u>SCIENTIFIC NAME</u>	<u>HOST</u>	<u>COUNTY</u>
Noctuid moth	<u>Acronicta funeralis</u>	Pin Oak	Ohio
Noctuid moth	<u>Copipanolis styraeis</u> <u>borealis</u>	Black light trap	Grant
Notodontid moth	<u>Heterocampa umbrata</u>	Red Oak	Grant
Tussock moth	<u>Dasychira basiflava</u>	White Oak	Hampshire
Sphingid moth	<u>Paonias excaecatus</u>	Apple tree	Ritchie
Sphingid moth	<u>Smerinthis jamaicensis</u>	Sugar Maple	Ritchie
Olethreutid moth	<u>Episimus argutanus</u>	Witch-Hazel	Pendleton
Oecophorid moth	<u>Psilocorsis obsoletella</u>	Oaks	Clay and Ritchie
Leaf beetle	<u>Chalepus scapularis</u>	Red Oak	Calhoun
Tenebrionid beetle	<u>Merinus laevis</u>	White Oak	Hampshire
Psyllid	<u>Psylla celtidisvesicula</u>	Celtis sp.	Kanawha

1974 ANNUAL SUMMARY
FOREST PEST ACTION PROGRAM
PATHOLOGY SECTION



The largest known American Chestnut (*Castanea dentata*) in West Virginia.
The tree is 27 inches DBH. Note the dead limbs from Endothia parasitica infections.

1974 ANNUAL SUMMARY
FOREST PEST ACTION PROGRAM

PATHOLOGY SECTION

DISEASE REPORTS

White Pine Root Decline

This is one of the most spectacular pine diseases that we have encountered. Healthy appearing trees seem to die almost overnight in much the same manner as a wilt disease infected hardwood. The causal organism, Verticicladiella procera, is a low temperature organism, which might explain why its relationship with the disease was unknown for so long. A complete description of the symptomology can be found in the August, 1974 Newsletter.

An intensified effort will be made to find any control measures that will reduce losses in Christmas tree stands. Losses of 40-50 trees per month in larger plantations are not unusual.

European Black Alder Canker

Laboratory inoculations of seedlings with a Cytospora species isolated from severely cankered alders planted on a strip mine site near Mabie, Randolph County did not cause the dieback associated with field trees. Small non-girdling cankers were formed on the test seedlings. It is now felt that the dieback was related to freeze injury as new canker development in 1974 was not evident.

Chestnut Blight

Work in West Virginia on American chestnut has taken several upward turns in the last couple of years. Due to diligent efforts of J. Bruce Given in particular, and several other individuals, progress is being made. We now have located native Chestnut trees in Doddridge, Randolph, Braxton, Nicholas, Pendleton, and Summers Counties and are collecting all available seed and scion material from promising trees and establishing planting areas for this material in Braxton County. All promising individuals (about 65 trees) planted by Dr. Roger Pease for the West Virginia Department of Agriculture in Mercer County have been transplanted to Braxton County. Interstate 77 will soon destroy the Mercer County site.

The work at West Virginia University has been picked up by Dr. Bill MacDonald and Dr. Frank Cech so that the 40 year old project located there has been saved and is being expanded. These workers are now collecting and planting third generation progeny.

Al Allison, Assistant State Forester, has provided much in information, contacts and moral support in getting the work rolling again.



J. Bruce Given standing beside a twenty-seven inch diameter American chestnut in Doddridge County.

Anthracnose and other Hardwood leaf diseases

Hardwood leaf diseases in the State were less severe in their impact than in the recent past. Defoliations in past years have so weakened many individuals that decline symptoms are very evident.

Late season leaf diseases such as buckeye blotch, (Guignardia aesculi), defoliate trees on a yearly basis but cause very little damage.

Physiological leaf scorch problems in West Virginia were again evident. Maples are the most commonly affected trees but other species also exhibit symptoms. Over-use of salt along roads and sidewalks contribute greatly to this problem.

Bull's eye leaf spot (Cristulariella pyramidalis), is causing localized defoliation of more than fifteen hardwood tree species and has also been reported on vegetable plants.

Wilt diseases

Ceratocystis fagacearum

1974 WEST VIRGINIA
OAK WILT DETECTION AND CONTROL PROGRAM

The 1974 Oak Wilt Detection and Control Program was initiated on June 3, and terminated October 11, 1974. Field offices were located in Romney, Beckley, Hamlin, and Parkersburg. At the height of the season a total of 50 men and 5 aircraft were employed in detection and control work.

As in past years, aerial observers, in low-flying aircraft, located the disease suspect and plotted the location of each on topographic quadrangle maps. Ground crews checked the suspects and if the aerial diagnosis was verified, the diseased trees were treated by the deep-girdle method or the method called for under the research or pilot study.

The season produced a total of 2111 diseased trees in 1568 infection centers. This compares with 2811 diseased trees in 2022 infection centers in 1973 or a decrease of 700 trees and 454 infection centers. The 1974 total includes 726 diseased trees located in 433 previously treated centers (breakovers) and 1385 trees in 1135 centers located for the first time in 1974. Of the newly located centers 548 or 48.3 percent were initial infections. The remaining 587 or 51.7 percent contained from one to six plus dead trees.

The disease was not found in 4 of our state counties (Brooke, Ohio, Tucker and Webster) in which it has not been found to date.

Red, black and scarlet oaks comprised 98% of the trees treated. The remainder were white oaks 1.0 percent, chestnut oaks .9 percent and scrub oaks 0.1 percent. An "average" center contained 1.3 wilting trees, 7.6 live compatible and 1.1 dead oaks.

A total of 2565 man days were worked on the ground and 1623 hours and 55 minutes were flown on aerial survey.

RESEARCH

As an outgrowth of the pilot project, work was carried out on the Keyser quadrangle to evaluate other chemicals for the control of the Oak Wilt Disease.

Potassium iodide, copper sulfate and a combination copper sulfate/cacodylic acid solutions were injected on respective areas of the Keyser quadrangle using the same technique of injection as the pilot project. This work is being done in an effort to find a better chemical tool than cacodylic acid. Evaluation of other compounds will be carried out in 1975 in the laboratory and field. The effect of the chemical is measured against both the oak wilt fungus Ceratocystis and the oak bark beetles Pseudopityphythorus spp.

This work is being conducted in cooperation with the West Virginia University, United States Forest Service, Northeast Forest Experiment Station and the West Virginia Department of Agriculture.

A reduction of fungus was experienced with all compounds tested. In the bioassay of Bolewood from randomly selected trees, the recovery of Ceratocystis fagacearum was reduced approximately 50%, 80%, and 60% in copper sulfate, potassium iodide and cacodylic acid/copper sulfate treatments respectively when compared to non-treated diseased oak trees.

A study to show the number and effect of root grafts between oak wilt infected trees was also initiated this summer. Thirty "centers" trees with a stocking of seven plus compatible oaks within 50 feet were inoculated with a dye solution containing oak wilt fungus spores. Initially about 10% of the treated trees showed a dye transfer to one or more nearby trees. These center trees will be watched for the next three years to determine passage of the oak wilt fungus through any root grafts to other adjacent trees.

From trees treated with cacodylic acid during the summer of 1973 and 1974, it was found that 41% of the treated trees appeared to have active root grafts to nearby oak trees. This present study was designed to substantiate this indication of a high percentage of root grafts.

This study is in cooperation with the United States Forest Service, Northeast Forest Experiment Station and West Virginia Department of Agriculture.

Verticillium albo-atrum - Verticillium wilt

Several symptomatic trees were reported this summer and a number were positively cultured for this disease. Heavy fertilizer applications to trees in early symptom classes help the trees recover from this disease. However, trees systematically infected normally die.

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Ceratocystis ulmi - Dutch elm disease

This disease appears to be increasing in West Virginia. Numerous samples were submitted and cultured this season.

Proper sanitation cutting and quick removal of diseased trees is still the best control for this disease although chemotherapy, using systemic fungicides, should soon become a useful tool.

* * * * *

Cronartium ribicola - White Pine Blister Rust

West Virginia has 310,388 acres of eastern white pine forest type in 577,083 acres of white pine blister rust control-area. Of this total, only 3390 acres are not on maintenance.

During the 1973-1974 fiscal year 66,278 acres were examined to determine the need for eradication of Ribes (control area examination). 2840 acres of new control area were mapped containing 1690 acres of white pine. One hundred and sixty acres of control containing 75 acres of pine were discarded.

A total of 7597 Ribes plants were destroyed in eradication work on 975 acres of control area. Post control evaluations were made on 1780 acres of land.

In addition to this work, 200 acres of planting sites were examined for Ribes populations. This is a quarantine requirement in high hazard areas and Service Foresters and Soil Conservation Service personnel should submit planting requests in the following counties to: Dana Keaton, Project Leader
Pipestem, West Virginia 24979

The affected counties are: Fayette, Grant, Greenbrier, Hardy, Mercer, Monroe, Pendleton, Pocahontas, Preston, Raleigh, Randolph, Summers and Tucker.

The greatest problem with this disease in West Virginia now is in cutover stands that are seeding back to white pine. Ribes seed that may have lain dormant for forty years germinates and the disease begins anew. Keeping track of this potential will remain a problem for years to come.

* * * * *

Numerous air pollution samples were submitted for diagnosis. The largest affected area this summer was located near Rivesville, Marion County. Samples submitted by the Air Pollution Control Commission for several species of plants exhibited excellent sulphur dioxide symptoms.

Eastern White Pine Blight

Severe decline symptoms have been observed in four Preston County white pine plantations for the past three years. The only possible explanation of the problem is a disruption of the soil mantle by the short-tail shrew (Blarina brevicauda) found in the area and trapped by Don Hebb, Service Forester, and Dr. Bill MacDonald. Wildlife specialists tell us that these animals should not be the cause of the problem since they are strict carnivores.

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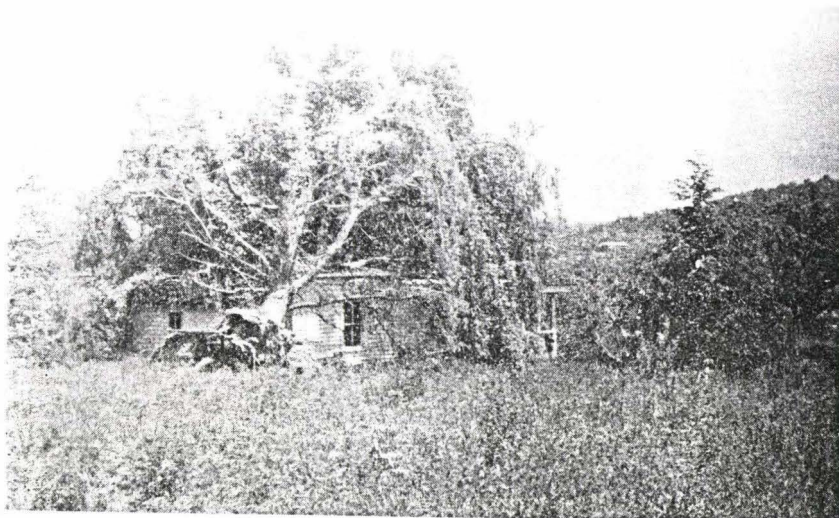
Walnut Decline

We have noticed and have had reported to us individual black walnut trees exhibiting decline symptoms for several years but have never had sufficient plants to work with. However, Jerry Atkins located a 25 acre stand of trees that have shown decline for several years. Preliminary root excavation work has revealed a

canker and rot problem. However, attempts to culture the organisms have failed to date. Further work including possible control activities are planned.

Wind Damage

Although unusual, high winds and resulting damage occurs in West Virginia. Tornado winds touched down in the Shady Spring and Meadow Bridge areas in early summer resulting in a great deal of property damage. Tree damage was restricted to open grown trees with large spreading crowns for the most part. Trees usually uprooted or broke off at the first major fork.



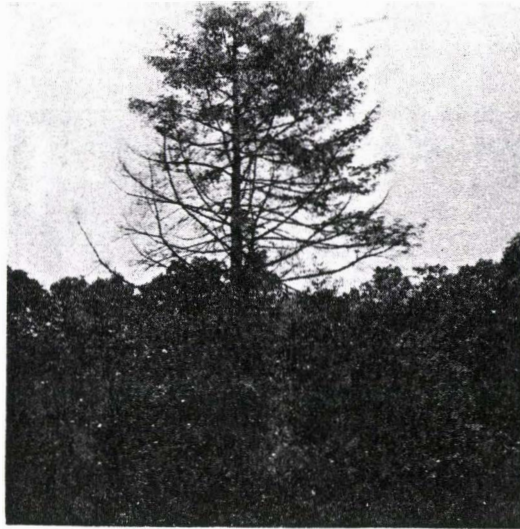
The time when a tree stops being a friend!

* * * * *

Hemlock Problems

Declining hemlock in the Monongalia, Tucker, and Preston County areas have been of concern for several years. Much of the damage to roadside trees, particularly in the Blackwater Falls State Park area, is being caused by salt application. Salt use in this area has been reduced following our findings.

The other type of damage, as pictured, appears to be related to an insect defoliation. Many of these individuals appear to be recovering.



Typical symptoms of a declining hemlock in the Etam, Preston County area. These trees showed some improvement this summer.

Nursery Diseases

Cylindrocladium scoparium

This root rot organism is the principal problem in both state tree nurseries. The organism produces tightly bound multi-celled structures called sclerotia, that are very resistant to standard fumigation techniques.

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Commercial nurseries have experienced many problems with physiological decline of Taxus sp. and hemlock. Water-logged clay soils and several water molds (Pythium and Phytophthora sp.) seem to be involved.

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Crown Gall - Agrobacterium tumefaciens

This disease has been found in three commercial nurseries this year and can be very damaging in tree nurseries as it infects many species of trees.



Large galls on a flowering cherry tree
caused by Agrobacterium tumefaciens

Snow Damage

Anyone who has observed the damage done to trees during the snows in November should have no problem in understanding how canker, stain and decay fungi gain entrance in forest trees. Damage in the physical sense will be with us for a long time to come. Trees in southern West Virginia still show evidence of a heavy snow in 1961.

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Lophodermium Needle Cast - Lophodermium pinastri

Damage due to this disease appeared to be lighter this year than for several years past. This is due in part to dry weather in the fall of 1973. However, we suspect that an increase will be noted in 1975 due to weather factors in 1974.

Control recommendations are available for Christmas tree plantations on request.

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Eastern White Pine Ozone Plots

Sixty trees showing one of four symptom classes due to damage by ozone, selected in 1971 in Greenbrier and Pocahontas Counties have been rated again. Although the visual damage is not as evident as in former years, trees continue to decline.

Ozone levels in this area reach as high as 16 parts per one hundred million, which is twice as high as that considered to be the upper allowable level.

TABLE I

		TREES BY SYMPTOM CLASSES			
ORIGINAL CLASS	NUMBER TREES		1972	1973	1974
I (1971)	15	(I)	14	11	10
		(II)	1	3	3
		(III)			1
		(IV)		(1 tree missing)	
II	15	(I)	2	3	3
		(II)	12	9	8
		(III)	1	3	3
		(IV)		(1 tree dead - Root Decline)	
III	15	(I)	3	4	
		(II)	6	3	5
		(III)	6	7	4
		(IV)			5
					(1 dead)
IV	15	(I)			
		(II)			2
		(III)	3	4	1
		(IV)	11	7	5
			(1 Dead)	(3 Dead)	(3 Dead)

Class I = Healthy

Class II = Tip Burn Less than 1/2 "

Class III = Tip Burn Greater than 1/2"

Class IV = Tufted and stunted needles

* * * * *

NOTEWORTHY PEST IDENTIFICATION LABORATORY SPECIMENS

Herbicide injury was identified on many samples submitted to the laboratory. These involved a number from industrial sources and several from homeowner mis-application. This problem seems to get larger and larger each year.

Wood decay specimens were also more numerous than in past years. Armillaria mellea was the most frequently encountered shade tree rot.

* * * * *

Iron chlorosis symptoms were identified from several pin oak, rhododendron and azalea samples. An interesting problem involving this chlorosis disease occurs when limestone chips are used as a mulch under these plants.

Three or four samples of boron deficiency of apple were also received. This deficiency causes a bitter cork spot in apple fruit.

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Two specimens of arborvitae were diagnosed as having leaf blight caused by Frabrella thujuni.

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Apple scab (Venturia inaequalis) and fire blight (Erwinia amylovora) specimens were numerous on apple samples from backyard orchards.

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Many requests are processed for weed identification and herbicide selection advice.

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Numerous other single specimen disease occurrences were received in 1974, but will not be listed due to their relative unimportance as problems statewide.

The Northeast Forest Pathology Workshop will be held at Blackwater Falls State Park on April 28, 29, and 30, 1975. West Virginia University and the West Virginia Department of Agriculture are co-hosts of this meeting of Forest Pathology Research Workers from the Northeastern United States and Eastern Canada.

Anyone wishing to attend these discussions of recent disease research findings and on-going disease research should contact:

Dr. Bill MacDonald
West Virginia University
401 Brooks Hall
Morgantown, West Virginia 26506

EASTERN SPRUCE GALL APHID - CONTROL WORK

Plant Pest Control Division personnel conducted chemical testing of four insecticides against the eastern spruce gall aphid (Adelges abietis) in Marion County in 1974. Each application was replicated four times in a randomized block pattern and control was measured by changes of numbers of galls per test between 1973 and 1974. Trees having more than 25 galls were considered brood trees and the count was stopped at that number. Each replication consisted of 10 trees or a total of 40 per test.

TABLE II

CHEMICAL	FORMULATION	TIME OF APPLICATION	NUMBER GALLS		PERCENT CHANGE
			OLD	NEW	
Liquid lime sulphur	1:15	Dormant	344	2	99.5
Sevin (4lb. Flowable)	2- $\frac{1}{2}$ T/Gal	Bud break	380	42	89.0
Lindane (20% E.C.)	1 T/Gal	Bud break	244	10	95.9
Cygon 2E	1 T/Gal	Bud break	338	49	85.5
Check	--	---	426	39	91.9

Although the population shows a natural decline, the liquid lime sulphur material appears to be superior. The beauty of the chemical is that it can (and should) be used as a dormant application thus eliminating problems in timing the application.

The Eastern Spruce Gall Aphid is one of the two most common Christmas tree insect pests.